

Growth Trajectory of Preterm Infants $\leq 1000\text{g}$ on an Exclusive Human Milk Diet – First Australian Experience:

An Interim Subgroup Analysis of the Personalised Enteral Nutrition (PEN) Study

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Background

In October 2023, a standardised nutrition quality improvement bundle was implemented, which included:

1. Exclusive human milk diet (EHMD) for preterm infants $\leq 1000\text{g}$. Enhancement of NICU dietitian hours
2. Nutrition allied health assistants to assist with accurate weighing and labelling of fortifiers and preparation of feeds
3. Standardised enteral feeding protocol for all infants.

EHMD consisted of mother's own milk (MOM) or pasteurised donor human milk (PDHM) fortified with human milk derived fortifier (Humavant, Prolacta Bioscience) from birth until 34 weeks corrected gestational age (CGA).

Methodology

- This is a prospective cohort study with historical controls prior to the introduction of the nutritional bundle. Historical controls received cow's milk based fortifier.
- The growth trajectory in the first 6 weeks of life was compared between inborn infants $\leq 1000\text{g}$ born after October 2023 (intervention group) and those born between January and June 2023 (historical controls).
- Weights and head circumference was measured weekly for all neonates.
- Mean (SD) values of weight and head circumference (HC) were compared at weekly intervals from birth (i.e birth, day 7, 14, 21, 28, 35, and 42)

Results

- There were 21 and 18 neonates in EHMD and control groups, respectively.
- In EHMD group, all neonates survived and there were no occurrence of necrotising enterocolitis (NEC). In the control group, there were 2 (11%) deaths due to late onset sepsis, and 2 (11%) proven NEC.
- Mean weights at all time points were higher in the EHMD group compared to the control (Figure 1)
- Mean head circumference was higher from day of life 21 to day of life 42 in the EHMD group compared to the control (Figure 2)
- Mean weight ($\pm\text{SD}$) in EHMD increased by 620 (± 222) g by day 42 compared to the control group 469 (± 154)g (p 0.017)
- Mean HC ($\pm\text{SD}$) in EHMD increased by 3.54 (± 2.57) cm by day 42 compared to the control group 2.46 (± 1.26) cm (p 0.11)

Figure 1. Weight trajectory of EHMD and control groups.

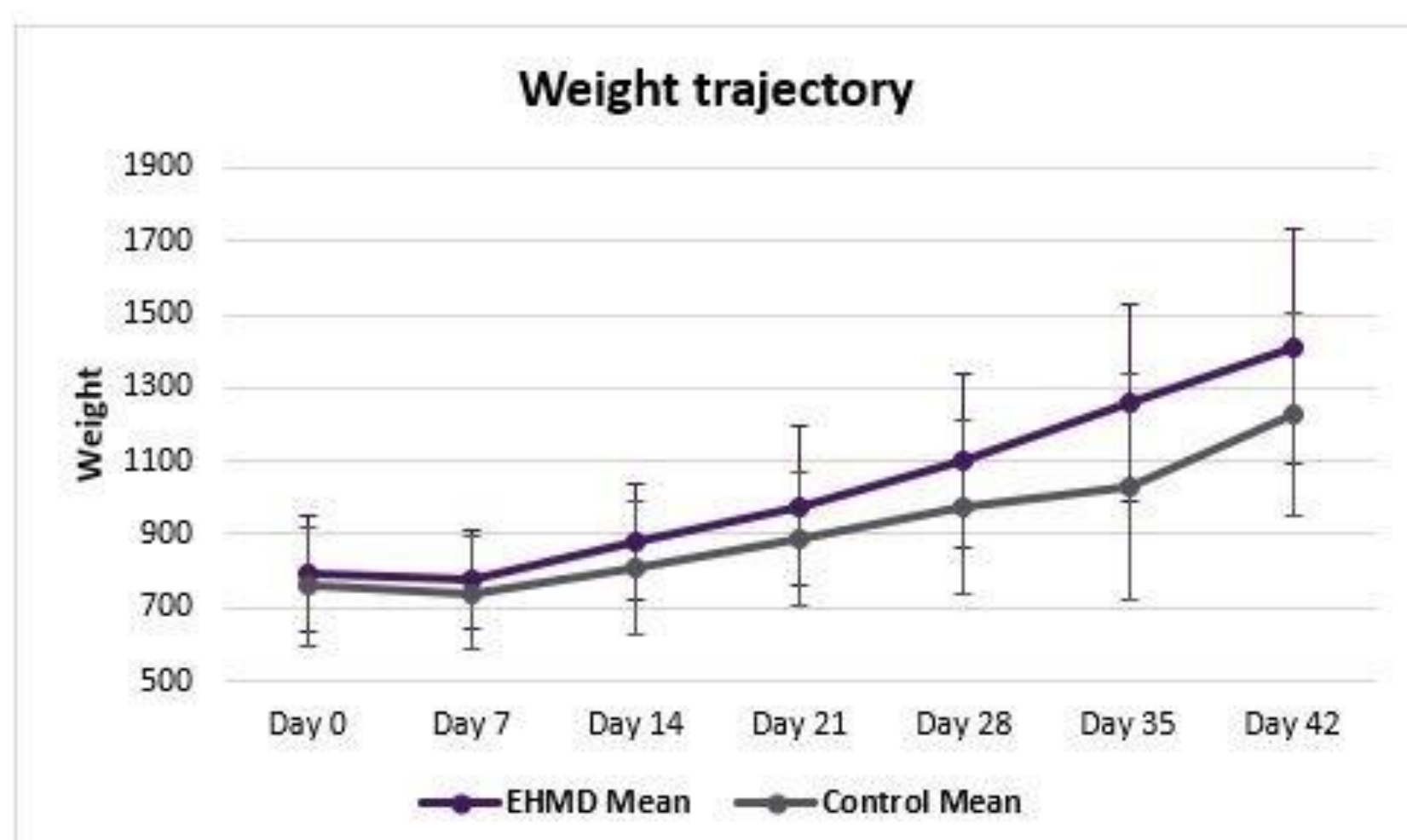
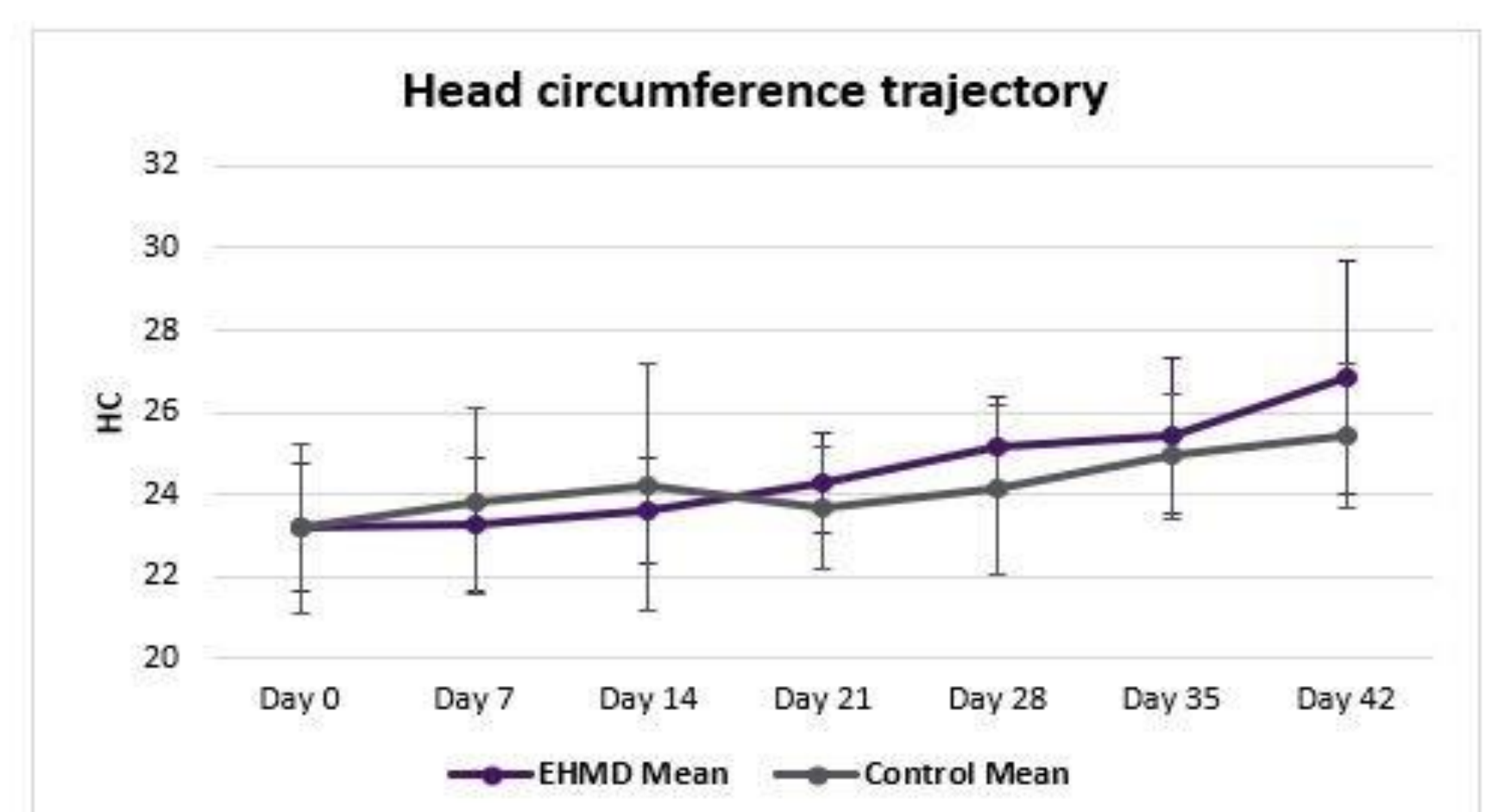


Figure 2. Head circumference trajectory of EHMD and control groups



Conclusions and Recommendation

There was a significant improvement in weight gain and a trend towards improvement in head circumference in the first 6 weeks of life in EHMD group.